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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,792	10/05/2006	Karlheinz Bing	BING ET AL. - 9 PCT	8699
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COLLARD & ROE, P.C. 1077 NORTHERN BOULEVARD ROSLYN, NY 11576			EXAMINER NGUYEN, HUNG Q	
			ART UNIT 3741	PAPER NUMBER
			MAIL DATE 01/20/2010	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/589,792

Applicant(s)

BING ET AL.

Examiner

HUNG Q. NGUYEN

Art Unit

3741

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 4 and 8-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 8-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/US)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is responsive to the amendment filed on 11/05/2009. Thus, claims 1, 4 and 8-13 are presently pending in this application.
2. Applicant's request for reconsideration of the last Office action, mailed on 08/06/2009, is persuasive and, therefore, that Office action is hereby withdrawn.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1, 4 and 8-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
5. Claims 1, 4 and 8-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.
6. Regarding base claim 1, the specification of the present invention is completely silent on providing a sleeve wherein "an outer surface of which has at least one flattened region reaching over its entire axial length". In particular, the claim requires

that the outer contour of the sleeve is formed having an "elliptical" cross-section, while at the same having a "flattened region reaching over its entire length". For example, figure 9 of the instant specification shows an embodiment of a sleeve having a "constant wall thickness" and an "elliptical cross-section". However, this particular embodiment does not show that the entire sleeve has any particular flattened region as claimed. On the other hand, the embodiment shown in figure 11 does show that the sleeve has a constant wall thickness, while the "outer surface" of which does have at least one flattened region but does not show that it has an "outer contour that is elliptical". Since the specification fails to clearly describe in such a way as to reasonably convey to one of ordinary in the relevant art that the inventor(s) had possession of the claimed invention, the claims fail to comply with the written description and enablement requirements.

7. Regarding base 4, the specification of the present invention is completely silent on providing a sleeve wherein "an outer surface of which has at least one flattened region reaching over its entire axial length". In particular, the claim requires that the outer contour of the sleeve is formed having "four arc shaped segments" in cross-section, while at the same having a "flattened region reaching over its entire length". For example, figure 6 of the instant specification shows an embodiment of a sleeve having a "constant wall thickness" and "four arc shaped segments 21-24". However, this particular embodiment does not show that the entire sleeve has any particular flattened region as claimed. On the other hand, the embodiment shown in figure 7 does show that the sleeve has a constant wall thickness, while the "outer surface" of which does

have at least one flattened region but does not show that it has "four arc shaped segments". Since the specification fails to clearly describe in such a way as to reasonably convey to one of ordinary in the relevant art that the inventor(s) had possession of the claimed invention, the claims fail to comply with the written description and enablement requirements.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1, 4 and 8-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Specifically regarding base claim 1, it recites the limitation "a depth of the roughened region" in line 5. There is insufficient antecedent basis for this limitation in the claim (i.e., the roughened region). Particularly, in line 11, the claim sets forth "a roughened region" in non-antecedent basis form, but it appears that the claim already sets forth a "roughened region". Are these not one and the same? If so, correction is required.

11. Specifically regarding claim 4, it recites the limitation "a depth of the roughened region" in line 7. There is insufficient antecedent basis for this limitation in the claim (i.e., the roughened region). Particularly, in line 10, the claim sets forth "a roughened region" in non-antecedent basis form, but it appears that the claim already sets forth a "roughened region". Are these not one and the same? If so, correction is required.

12. Regarding claim 8, it recites the limitation "a flattened region" in non-antecedent basis form, but claim 1 already sets forth "at least one flattened region". Are these not one and the same? If so, correction is required. Furthermore, it recites the limitation "the crankcase" in the last line. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. **Claims 1 and 9, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kodama (US 7,226,667 B2) in view of Burch (US 2,810,378) and Hill (US 6,557,513 B1), and further in view of Oh (US 6,920,859 B2).**

15. **Regarding claim 1**, Kodama discloses a cylinder sleeve 10 (fig. 1-3) for an internal combustion engine wherein the cylinder sleeve 10 is configured as a rough-cast sleeve, the outer surface 16 of which has a roughened region (fig. 1-2) reaching over its entire axial length (col. 7, lines 1-9) and consisting of a plurality of elevations with undercuts 18 and wherein a height of the elevations is between 0.2 mm to 2 mm (see col. 4, lines 60-63) and wherein the cylinder sleeve 10 has a constant wall thickness.

Furthermore, Kodama discloses the cylinder sleeve as essentially claimed except for the outer surface of which has at least one flattened region reaching over its entire length.

The patent to Burch ('378) discloses that it is conventional in the art of cylinder sleeves to provide a cylinder sleeve 18 (fig. 1-2), an outer surface of which has at least one flattened region reaching over its entire length (see col. 1, lines 58-71).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as taught by Kodama, to incorporate a cylinder sleeve wherein the outer surface of which has at least one flattened region reaching over its entire length, as suggested and taught by Burch, for the purpose of providing a lightweight engine block wherein the engine block is smaller in size due to the reduced length required by the cylinder sleeves (see col. , lines 37-41).

Accordingly, Kodama and Burch, as a combination, teaches a cylinder sleeve wherein the sleeve is configured as a rough-cast sleeve, the outer surface of which has a roughened region reaching over its entire axial length and consisting of a plurality of elevations with undercuts and wherein the height of the elevations is between 0.2 to 2 mm, wherein the cylinder sleeve has a constant wall thickness, and that the outer surface of which has at least one flattened region reaching over its entire axial length.

However, the combination of Kodama and Burch does not teach that the **outer contour** of the cylinder sleeve is elliptical in cross-section.

On the other hand, Hill teaches that it is conventional in the art to provide a cylinder sleeve comprising an **outer contour that is elliptical** in cross-section (see Abstract).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as suggested by the of combination of Kodama / Burch, to employ a cylinder sleeve having an outer contour that is elliptical in cross-section, as suggested by Hill, in order to allow engine designer to reduce overall length of the engine due to shortened bore spacing requirements (see Abstract and col. 4, lines 4-20).

Furthermore, a change in form or shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey*, 149 USPQ 47 (CCPA 1976).

Thus, the combination of Kodama and Burch together with the teaching of Hill, provides a cylinder sleeve as essentially claimed.

Accordingly, the combination of Kodama / Burch / Hill does teach a cylinder sleeve having an outer contour that is formed by a depth of the roughened region that is **constant over the circumference**. Thus, it is clear that the combination of Kodama / Burch / Hill does not teach that the outer contour is formed by a depth of the roughened region that **varies** over a circumference.

However, the patent to Oh discloses that it conventional to provide a cylinder sleeve 1 (fig. 1-2) comprising an external surface (i.e., outer contour) that is roughened to provide protrusions 5 with undercuts (3, 15), **wherein the depth of this roughened region is varied over the circumference of the sleeve 1** (see col. 2, lines 1-37) for the purpose of providing a strong coupling structure between the liner and the cylinder blocks (see col. 2, lines 32-37).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as suggested the combination of Kodama / Burch / Hill, to incorporate a cylinder sleeve wherein its outer contour is formed by **a depth of the roughened region that varies over a circumference**, as suggested and taught by Oh, for the purpose of provided a strong coupling structure between the liner and the cylinder blocks.

Thus, the entire combination leads to a cylinder sleeve for an internal combustion engine, an outer contour of which has at least one flattened region reaching over its entire axial length, an outer contour that is elliptical in cross-section and is formed by a depth of the roughened region that varies over a circumference, said sleeve having a constant sleeve wall thickness, wherein the cylinder sleeve is configured as rough-cast sleeve, the outer surface of which has roughened region reaching over its entire axial length and consisting of a plurality of elevations with undercuts and wherein a height of the elevations is between 0.2 mm to 2 mm.

16. **Regarding claim 9**, the claimed phrase "spin casting" is being treated as product-by-process limitations and since it has been held that a product-by-process limitation is not construed as being limited to the product formed by the specific process recited, therefore, even though Kodama is silent as to the process used to produce the cylinder sleeve, it appears that the Kodama's product would be the same or similar as that claimed, especially since both applicant's product and the prior art product is made of cast iron material (col. 4, lines 44-46).

17. **Claim 8, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kodama / Burch / Hill / Oh, and further in view of Field (US 4,903,652).**

18. **Regarding claim 8, as best understood**, the combination of Kodama / Burch / Hill / Oh teaches the cylinder sleeve as essentially claimed. However, in particular, Burch fails to explicitly teach that the at least one flattened region is provided with a step having a flattened region lying radially on the outside, on its lower side facing the crankcase (not shown).

The patent to Field ('652) teaches that it is conventional in the art of cylinder liners (sleeves) to provide a step 112 (fig. 2-3) on a flattened region (i.e., this is the region connecting the cylinder sleeves 102 together), wherein the step 112 has a flattened region lying radially on the outside, on its lower side facing the crankcase.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as suggested by the combination, to provide the at least one flattened region (see Burch's figures 1-2) with a step having a flattened region lying radially on the outside, on its lower side having the crankcase, as suggested by Field, in order to provide a way of joining the cylinder sleeves together which permits a more compact, light weight and space efficient engine designs while providing good heat transfer characteristics between cylinders at their critical combustion ends (see Field's column 1, lines 58-67 & col. 2, lines 8-13).

19. **Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kodama / Burch / Hill / Oh, and further in view of Dickmann et al. (US 6,748,655 B2).**

20. **Regarding claim 10**, Kodama / Burch / Hill / Oh disclose the cylinder sleeve as essentially claimed except for wherein the cylinder sleeve consists of an aluminum-silicon alloy.

Dickmann teaches that it is conventional and well known in the art to provide cylinder sleeves (i.e., liners) which consists of an aluminum-silicon alloy in order to increase the wear resistance of the piston running surfaces (see col. 1, lines 21-25).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as taught by Kodama / Burch / Hill / Oh, to incorporate a cylinder sleeve wherein it consists of an aluminum-silicon alloy, as suggested and taught by Dickmann, for the purpose of increasing the wear resistance of the piston running surfaces.

21. Note, it would have also been obvious to one having ordinary skill in the art at the time the invention was made to employ aluminum-silicon alloy as a material for the cylinder sleeve, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

22. **Regarding claims 11-13**, the claimed phrases "gravity casting", "spin casting" and "lost-foam casting" are being treated as product-by-process limitations and since it has been held that a product-by-process limitation is not construed as being limited to

the product formed by the specific process recited, therefore, even though Dickmann is silent as to the process used to produce the cylinder sleeve, it appears that the Dickmann's product would be the same or similar as that claimed, especially since both applicant's product and the prior art product is made of aluminum-silicon material (see Dickmann's column. 2, lines 25-53).

23. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kodama, Burch and Gobbels (US 6,182,629), and further in view of Oh (US 6,920,859 B2).

24. Regarding claim 4, Kodama discloses a cylinder sleeve 10 (fig. 1-3) for an internal combustion engine wherein the cylinder sleeve 10 is configured as a rough-cast sleeve, the outer surface 16 of which has a roughened region (fig. 1-2) reaching over its entire axial length (col. 7, lines 1-9) and consisting of a plurality of elevations with undercuts 18 and wherein a height of the elevations is between 0.2 mm to 2 mm (see col. 4, lines 60-63) and wherein the cylinder sleeve 10 has a constant wall thickness.

Furthermore, Kodama discloses the cylinder sleeve as essentially claimed except for the outer surface of which has at least one flattened region reaching over its entire length.

The patent to Burch ('378) discloses that it is conventional in the art of cylinder sleeves to provide a cylinder sleeve 18 (fig. 1-2), an outer surface of which has at least one flattened region reaching over its entire length (see col. 1, lines 58-71).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as taught by Kodama, to

incorporate a cylinder sleeve wherein the outer surface of which has at least one flattened region reaching over its entire length, as suggested and taught by Burch, for the purpose of providing a lightweight engine block wherein the engine block is smaller in size due to the reduced length required by the cylinder sleeves (see col. , lines 37-41).

Accordingly, Kodama and Burch, as a combination, teaches a cylinder sleeve wherein the sleeve is configured as a rough-cast sleeve, the outer surface of which has a roughened region reaching over its entire axial length and consisting of a plurality of elevations with undercuts and wherein the height of the elevations is between 0.2 to 2 mm, wherein the cylinder sleeve has a constant wall thickness, and that the outer surface of which has at least one flattened region reaching over its entire axial length.

However, the combination of Kodama and Burch does not teach that the **outer contour** of the cylinder sleeve consists, in cross-section, of four arc shaped segments that are approximately the same size.

On the other hand, Gobbels teaches that is it conventional in the art to provide a cylinder sleeve (see figure below) comprising an outer contour that consists, in cross-section, of four arc-shaped segments that approximately the same size.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as suggested and taught Kodama / Burch, to incorporate a cylinder sleeve having an outer contour that consists, in cross section, of four arc-shaped segments that are approximately the same size, as

suggested by Gobbels, for the purpose of preventing the occurrence of distortions during casting or engine operation (col. 1, lines 54-56).

Furthermore, a change in form or shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey*, 149 USPQ 47 (CCPA 1976).

Thus, the combination of Kodama and Burch together with the teaching of Gobbels, provides a cylinder sleeve as essentially claimed.

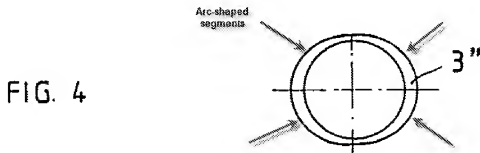
Accordingly, the combination of Kodama / Burch / Gobbels does teach a cylinder sleeve having an outer contour that is formed by a depth of the roughened region that is **constant over the circumference**. Thus, it is clear that the combination of Kodama / Burch / Gobbels does not teach that the outer contour is formed by a depth of the roughened region that **varies** over a circumference.

However, the patent to Oh discloses that it conventional to provide a cylinder sleeve 1 (fig. 1-2) comprising an external surface (i.e., outer contour) that is roughened to provide protrusions 5 with undercuts (3, 15), ***wherein the depth of this roughened region is varied over the circumference of the sleeve 1*** (see col. 2, lines 1-37) for the purpose of providing a strong coupling structure between the liner and the cylinder blocks (see col. 2, lines 32-37).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cylinder sleeve, as suggested the combination of Kodama / Burch / Gobbels, to incorporate a cylinder sleeve wherein its outer contour is formed by a **depth of the roughened region that varies over a**

circumference, as suggested and taught by Oh, for the purpose of provided a strong coupling structure between the liner and the cylinder blocks.

Thus, the entire combination leads to a cylinder sleeve for an internal combustion engine, an outer contour of which has at least one flattened region reaching over its entire axial length, and an outer contour that consists, in cross-section, of four arc shaped segments that are approximately the same size and which is formed by a depth of the roughened region that varies over a circumference, said sleeve having a constant sleeve wall thickness, wherein the cylinder sleeve is configured as rough-cast sleeve, the outer surface of which has roughened region reaching over its entire axial length and consisting of a plurality of elevations with undercuts and wherein a height of the elevations is between 0.2 mm to 2 mm.



Response to Arguments

25. Applicant's arguments filed on 11/05/2009 have been fully considered but they are not persuasive.
26. With respect to claim 1, the applicant argues that the reference, Oh, fails to show that "the outer surface of the sleeve is to be given a specific shape, for example an

elliptical cross-section shape by means of varying the size of the extensions". The examiner respectfully disagrees with this assertion. Note that claim 1 clearly recites the limitation "an outer contour that is elliptical in cross-section and is formed by a depth of a roughened region that varies over a circumference". Thus, claim 1 merely recites that the "outer contour" is formed by a depth of roughened region that varies over a circumference. It is noted that the reference, Oh, was cited to provide a teaching that the roughened region (i.e., provided by extensions 5) does vary by the fact that the extensions 5 are provided alternately with one another, wherein each one of the extensions have different heights (i.e., sizes). Thus, the extensions 5 do vary over the circumference of the cylinder sleeve. Furthermore, it is clear to the examiner that the reference, Oh, does not teach that the outer contour of the sleeve has an elliptical cross-section. However, the teaching and the motivation for such an elliptical shape is clearly suggested by the recited reference Hill.

27. With respect to claim 4, the applicant argues that the reference, Gobbels, fails to teach a cylinder sleeve having an outer contour that consists of four arc-shaped segments that are approximately the same size. The examiner respectfully disagrees with this assertion. As clearly shown in figure 4, the horizontal and vertical axes create different segments wherein each segment is provided in quadrants I, II, III and IV. Since each one of these arc-shaped segments is a mirror image of each other, they clearly have approximately the same size.

Conclusion

Applicant is duly reminded that a complete response must satisfy the requirements of 37 C.F. R. 1.111, including: "The reply must present arguments pointing out the specific distinctions believed to render the claims, including any newly presented claims, patentable over any applied references. A general allegation that the claims "define a patentable invention" without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the requirements of this section. Moreover, "The prompt development of a clear Issue requires that the replies of the applicant meet the objections to and rejections of the claims." Applicant should also specifically point out the support for any amendments made to the disclosure. See MPEP 2163.06 II(A), MPEP 2163.06 and MPEP 714.02. The "disclosure" includes the claims, the specification and the drawings.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG Q. NGUYEN whose telephone number is (571) 270-5424. The examiner can normally be reached on Mon-Thu 8am - 4pm and alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MICHAEL CUFF can be reached on (571) 272-6778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HUNG Q. NGUYEN/
Examiner, Art Unit 3741

/Michael Cuff/
Supervisory Patent Examiner, Art Unit 3741